

Centerville River Subwatershed Barnstable, Cape Cod, Massachusetts

The Centerville River Subwatershed is located in the Town of Barnstable. It has an area of 7,952 acres. Route 28 runs through the center of this subwatershed. There are numerous waterbodies in this watershed, the largest of which are Wequaquet Lake, Long Pond, and the Centerville River complex. The Centerville River is connected to Centerville Harbor through East Bay, and the harbor opens into Nantucket Sound.

The Coastal Nitrogen Loading Project conducted by the Cape Cod Commission in 2000 found that the Centerville River/East Bay coastal system is overloaded with nitrogen. The projected nitrogen loading associated with buildout in most areas of the subwatershed will increase the existing nitrogen load by 11-14 percent.

The East Bay River Estuary is relatively shallow. Upper reaches of the estuary such as Scudder Bay may be experiencing a decline in water quality. The East Bay River Estuary is within a Rare Species Habitat as mapped by MA Natural Heritage (MANH) in their 2000-2001 Atlas. The estuary contains shellfish resources.

A flushing study conducted in 1996 concluded that East Bay and lower Centerville River flush relatively efficiently with residence times on the order of one day. Flushing is less efficient for inland portions of the estuary, such as Phinney's Bay, Bump's River, Scudder Bay, and the upper reaches of Centerville River, where residence times are greater than three days. A decline in water quality may be expected within these inland regions, depending upon the pollutant/nutrient loading rates, as well as biological and biogeochemical processes.

Red Lily Pond is exhibiting a mucky gelatinous bottom that is rendering the pond unsuitable for swimmable/fishable use. This is causing a methane gas odor and impacts the flushing rate of the pond. Species diversity is severely reduced. In a 1998 diagnostic feasibility study of Red Lily Pond, three sources of excess phosphorus were noted.

Some waterbodies in this subwatershed are having trouble with invasive species. Lake Wequaquet and Bearse Pond are experiencing problems with fanwort, a non-native, nuisance aquatic plant. A pioneer invasion of hydrilla, an invasive, non-native species, was discovered in Long Pond in the fall of 2001. This is the first pond in which hydrilla has been found in Massachusetts. The species can potentially take over the pond and eliminate fishing and swimming.

Although the Centerville River/East Bay estuary system is closed to commercial and residential shellfishing due to poor water quality, the town has harvested seed clams from the area for replanting in other areas of town that are open to shellfishing.

Portions of the Centerville River serve as an anadromous fish run for alewives. These fish runs serve as spawning migration routes to Scudder Bay and Long Pond.

Approximately one-quarter of the Town of Barnstable is municipally sewered. The sewered area of Barnstable extends from the Cape Cod Hospital up Route 132 to Independence Park, with an extension that serves Barnstable Village. The town completed a Draft DEP Wastewater Facilities Plan. Municipal water is supplied to most Barnstable residents through five separate water districts.

Stewards:

- Wequaquet Lake Protective Association
- Red Lily Pond Association, Inc.
- B.A.R.S. (Barnstable Association of Recreational Shellfishing)
- Long Pond Association

Studies conducted in the watershed:

- Town of Barnstable Wastewater Facilities Plan. Identified several areas where there are public health and environmental concerns that are caused by failing septic systems and/or dense population concentrations in zones of contribution to public water supply wells or are major nutrient contributors to surface water bodies.
- Diagnostic Feasibility Study of Red Lily Pond in 1988 under the MA Clean Lakes Program.
- Wequaquet Lake Diagnostic/Feasibility Study. Massachusetts Department of Environmental Protection.
- Lake Wequaquet Water Level Study. December 1998. Cape Cod Commission Water Resources Office.
- Tidal Flushing within the East Bay/Centerville River Estuary: Existing Conditions and Effects of Proposed Dredging, Final Report. September 1996. Aubrey Consulting, Inc., Cataumet, MA.
- Centerville River Dredging and Long Beach Nourishment: Environmental Notification Form. September 2000. Woods Hole Group, East Falmouth, MA.
- Coastal Nitrogen Loading Project: Interim Report. September 2000. Cape Cod Commission Water Resources Office.
- Coastal Nitrogen Loading Project: Final Report. April 2002. Cape Cod Commission Water Resources Office. (one of four sites assessed was Centerville River/East Bay).
- Cape Cod Atlas of Tidally Restricted Salt Marshes. 2001. Cape Cod Commission.

Who is collecting water quality data and where:

- Wequaquet Lake Protective Association – Pondwatchers
Sampling done once a month at 12 locations on Wequaquet Lake and Bearse Pond. Data collected on water temperature, dissolved oxygen, pH, clarity, fecal coliform bacteria, *E. coli* bacteria, and phosphate.
- Town of Barnstable Department of Public Works – 15 stations in Centerville Harbor, including Hall's Creek, East Bay, Scudder Bay, and Bump's River. Eight sampling events. Sampling for:
Physical – total depth, Secchi depth, temperature, oxygen content, salinity, waterbody state (a subjective observation of general conditions), weather, wind speed, and direction.
Laboratory analyses – nitrate and nitrite, ammonium, dissolved organic nitrogen, chlorophyll, orthophosphate.

Management actions taken:

- Wastewater from 16 homes alongside Red Lily pond began being collected and disposed of out of the groundwater recharge area of the pond in 1993/94.
- Work to rejuvenate Red Lily Pond and the associated herring run to return them to their former condition as a healthy environment for freshwater organisms is ongoing (319 NPS Project). In 1997, subsidence dredging and reverse relayering were used to deepen the pond and seal off the nutrients that accumulated on the bottom. Weed growth was removed by hydroraking. Storm drainage from an adjacent road was infiltrated to eliminate a direct discharge to the pond.
- In August 1998, a Vortec unit was installed on the culvert that carries the “mosquito ditch” (an identified source of excess nitrogen) under Old Craigville Road. This unit removes sediment from the water in the ditch to reduce the P loading of the Red Lily Pond.
- Two catch basins were installed on Old Craigville Road and the basins were piped to buried plastic infiltration chambers, to reduce the phosphorus loading on Red Lily Pond from stormwater runoff.

- In the summer of 2000 the Barnstable Conservation Commission approved the application of the herbicide Sonar to kill the invasive aquatic plant fanwort in Wequaquet Lake. The town began treating Bearnse Pond for fanwort in 2001.
- The Town of Barnstable has received all necessary permits to perform Phase 1 of a two-phase maintenance and improvement dredging in the Centerville River/East Bay Estuary system for the purpose of improving navigation (2002). The total project will dredge an estimated 67,000 cubic and the sandy portion of the dredge soil will be used as beach nourishment on Long Beach.
- The Department of Conservation and Recreation Invasive Species Response Team is researching methods of eradicating hydrilla from Long Pond before it spreads to other ponds. The two public boat landings are closed until this problem is resolved. The Town of Barnstable and the Association for the Preservation of Cape Cod received a \$25,000 grant from the 2002 Lakes and Ponds Program for hydrilla control.
- Town of Barnstable is participating in SouthEastern Massachusetts Aquaculture Center's scallop restoration project, with the goal of populating Barnstable embayments with bay scallops by establishing broodstock sanctuaries.
- Town of Barnstable broadcasted 236,900 two year old quahogs on the Southside of Barnstable in the summer of 2001.
- Massachusetts Division of Fisheries and Wildlife stocks Shubael Pond with rainbow, brook, and brown trout.
- Town of Barnstable is applying for State Revolving Fund (SRF) funds for a Nutrient Management Planning Project. This is a comprehensive project to manage wastewater, stormwater, and fertilizer loadings that are causing nutrient and other water quality related problems to the town's coastal and fresh water bodies. Project area includes the entire Town of Barnstable, Shoestring Bay recharge area of the Popponesset Bay Watershed, Three Bay Subwatershed, Centerville River/East Bay Subwatershed, and Barnstable Harbor Subwatershed.
- Town of Barnstable is participating in the DEP Estuaries Project, a comprehensive evaluation of embayments in Southeastern Massachusetts that uses citizen water quality monitoring and water quality modeling of the embayments to evaluate nitrogen removal strategies in the embayment watershed.
- Engineering design studies for sewerage the area around Lake Wequaquet have been initiated.
- The Centerville River Harbor has been designated a No Discharge Area by the state.

Subwatershed facts: (For data sources see the Appendix)

- 21 E sites: 4. Locations are a residence on Lumberts Mill Rd.; Sunoco Station, Falmouth Rd.; Zevita's, 401 Main St.; and the Mobil Station on Route 132.
- Solid waste sites: none
- Zone IIs located in this watershed: approximately 6
- Interim Wellhead Protection Areas (IWPAs): 1
- Percent of the undeveloped land that is protected (according to 1985/1990 data): 12%
- Acres of existing wetlands: 292
- Certified vernal pools: 3
- Named freshwater ponds: Shubael, Round, Lumbert, North, West, Micah, Joshua, Sam, North, Coleman, Long, Shallow, Red Lily, Bearnse, Wequaquet Lake, Lake Elizabeth
- Named rivers or creeks: Centerville River, Bump's River, Hall's Creek
- 1998 Massachusetts 303(d) List of Impaired Waterbodies: Bearnse Pond – noxious aquatic plants. The Centerville River, including East Bay – pathogens. Bumps River, including Scudder Bay –

pathogens. Red Lily Pond – nutrients, pathogens, and noxious aquatic plants. Shallow Pond - noxious aquatic plants.

- Shellfish growing areas: Centerville River/East Bay estuary system is closed to commercial and residential shellfishing.
- This subwatershed contains Natural Heritage and Endangered Species Program (NHESP) Estimated Habitats of Rare Wildlife.

Priorities:

- Continue town-wide water quality monitoring.
- Conduct comprehensive wastewater management planning and assess sewer collection systems for areas around Lake Wequaquet and Long Pond.
- Develop and implement TMDL for Bearse Pond, Red Lily Pond, and Shallow Pond (from DEP Watershed Status Report and Actions Taken, 2002).
- Town needs to identify sites for future dredged material disposal.
- Upgrade road drainage systems to halt the discharge of storm water into Lake Wequaquet.
- Install outlet structure and additional fish ladders and stream bank protection on Long Pond to improve the herring run.
- Manage nuisance aquatic plant “fanwort” on Bearse Pond and Wequaquet Lake. Best treatment is Sonar. Examine all alternatives and implement program that best eliminates infestation with the fewest environmental side effects.
- Address invasion of hydrilla in Long Pond.
- Joshua, Micah, Round, and Coleman Ponds and Lake Elizabeth need volunteers to participate in the Pond and Lakes Stewardship Project (PALS), measuring water quality and other characteristics of the ponds.
- Investigate the potential for rejuvenating the herring run on Red Lily Pond.
- Implement those salt marsh restoration projects identified in the 2001 *Cape Cod Atlas of Tidally Restricted Salt Marshes* that have been evaluated and prioritized by the town. Sites are: East Bay Road restriction of an unnamed creek (Site BA-11), Bay Lane restriction of unnamed channel off the Bumps River (BA-12), Craigville Beach Road restriction of the Centerville River (BA-13), and Pleasant Street restriction of channel to Lake Elizabeth (BA-14).
- Acquire open space. Parcels considered a priority for acquisition for water supply protection and development: Barnstable Tracts 2, 3, 4, 5, 7, 14, 16, 17, 19, 21, 24, 26, 27, 29, 31, 35, 37, 41, 43, 45, 48, 49, 53, 55, and 56 were ranked as having medium or high water supply development potential in the Cape Cod Commission’s *Priority Land Acquisition Assessment Project* (April 1999). These tracts are located throughout the Town of Barnstable.

Recreation:

Camping areas: none

Golf courses:

- Olde Barnstable Fairgrounds Golf Course

Pathways and trails:

- www.capecodcommission.org/pathways/trailguide.htm

Public access:

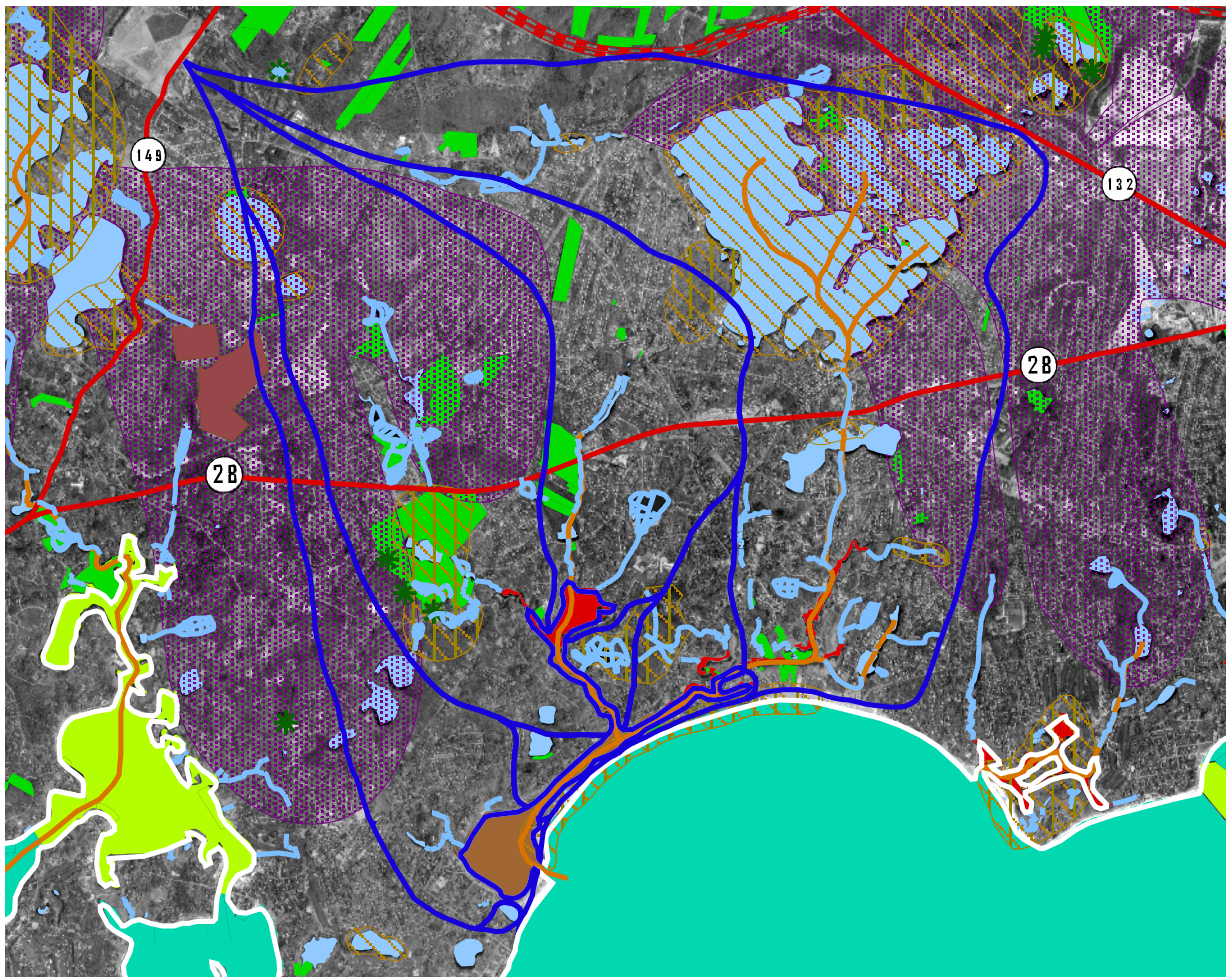
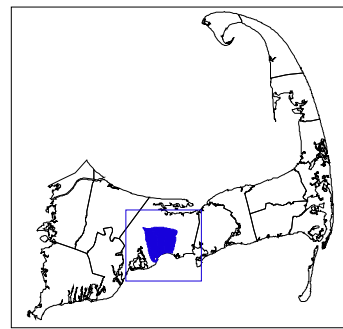
- www.state.ma.us/dfwele/pab/pabSEmap.htm

Public beaches and landings:

- Landings on Long Pond (2 landings), Shallow Pond, Shubael Pond, Joshua Pond, Wequaquet Lake, and Centerville River, East Bay, and Craigville Beach
- Beach on Wequaquet Lake, Joshua Pond
- Covell Beach, Craigville Beach, Long Beach, Dowses Beach

Centerville River

Barnstable, MA



Watershed Resources



0 0.5 1 1.5 2 Miles

Natural Heritage and Endangered Species Program Data

- Certified Vernal Pool
- Priority Habitats of Rare Species
- Estimated Habitats of Rare Species

Groundwater Protection Areas

- Interim Wellhead Protection Area
- Zone II
- Solid Waste Facility

Watershed Boundary

Anadromous Fish Run

Shellfish Growing Areas

- APPROVED
- CONDITIONALLY APPROVED
- MANAGEMENT CLOSURE
- PROHIBITED
- RESTRICTED

Open Space

Streams

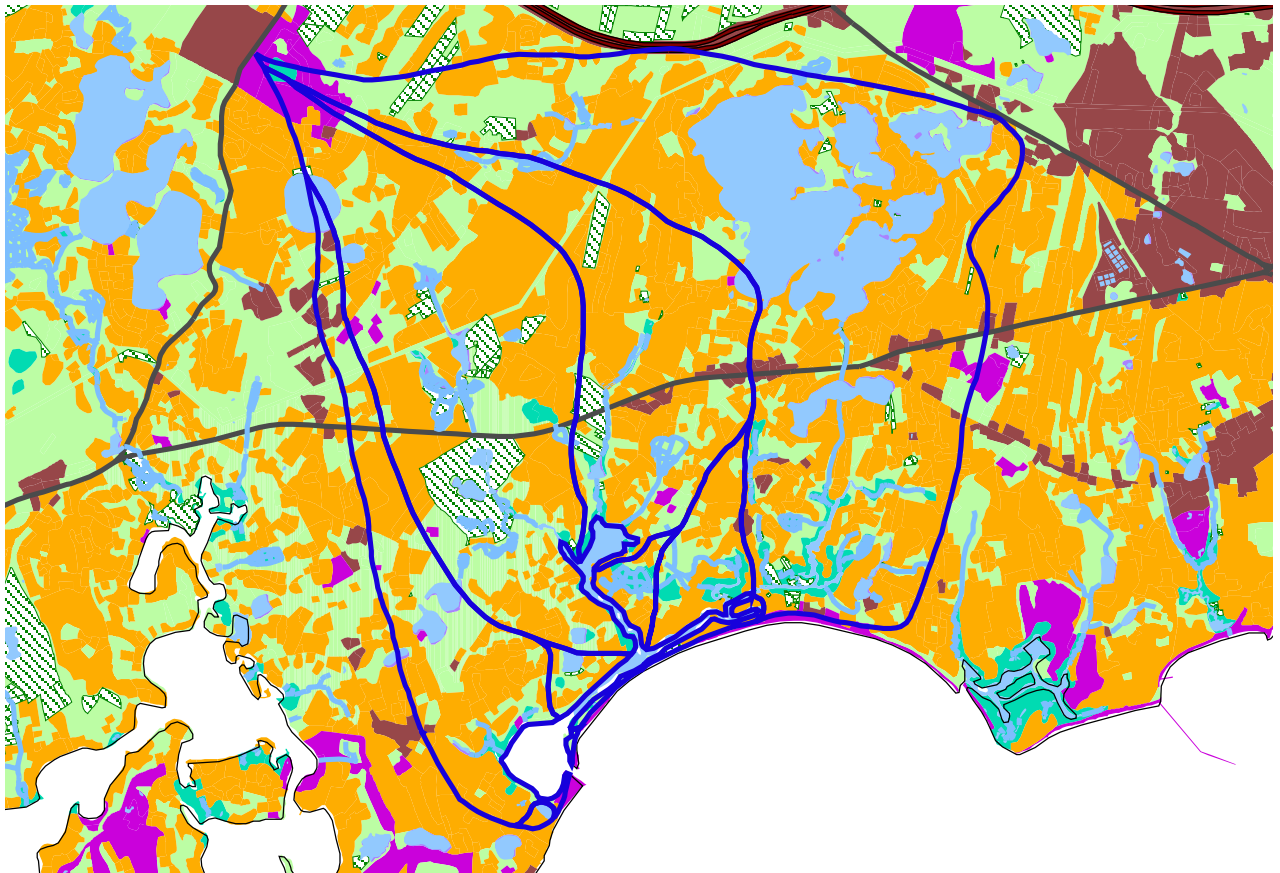
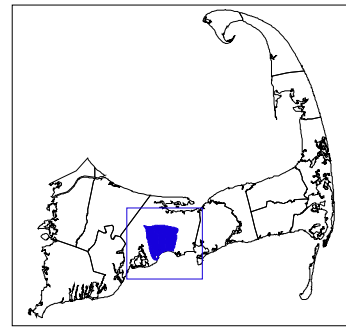
Ponds

Roads



Centerville River

Barnstable, MA



Land Use



0 0.5 1 1.5 2 Miles

Land Use

- non-residential developed
- open land
- recreation
- residential
- water
- wetland

- Streams
- Ponds
- Watershed Boundary
- Protected Open Space

